

## Can the military transport market grow?

For years, the military transport industry has been relatively stagnant. The U.S. has spent heavily on strategic and intratheater lift, while everyone else has made do with old equipment and converted jetliners. This market has typically been worth between \$3 billion and \$4 billion annually—less than half the value of the fighter jet market—with few hopes for growth.

Yet the launch of Europe's A400M, coupled with a realization that the U.S. might require additional transport resources, has renewed hopes that this segment could finally grow above its historical levels.

### U.S. market: Endless?

Given the current strategic situation (war on terror, war in Iraq, and possibly more beyond that), it is no surprise that U.S. lift funding has continued at a very healthy level. Right now, the Air Force relies on five types of aircraft to meet its 54.5 million ton-miles per day strategic airlift requirement, which was raised from 49.4 million ton-miles in late 2000.

As the Boeing C-17 replaces the Lockheed C-141 (the last C-141 will retire by

around 2006), the number of types will move to four. The C-17/C-141 fleets handle about 13 million ton-miles, the KC-10s handle about 5 million (when operating as transports rather than aerial refueling tankers), and the C-5s handle the lion's share—about 14 million ton-miles.

The rest is handled by the Civil Reserve Aircraft Fleet (CRAF), which provides about 573 planes, including over 350 widebodies, in an emergency. About 240 CRAF planes are configured for cargo and another 280 for passengers, with the remaining 50 or so in an aeromedical configuration.

Historically, according to DOD, 93% of U.S. troops and 41% of military cargo have been moved by chartered commercial aircraft. Still, according to the Air Force, the country's lift capability falls about 10 million ton-miles short of the stated requirement.

As a result, additional C-17s are likely. The C-17 acquisition program has grown to 180 planes, and the Air Force has indicated a need for at least 42 more, raising the total to 222. A decision on the next batch should be made sometime in



The last C-141 will retire by around 2006, replaced by the C-17.

2004 or 2005. As the only active U.S. strategic lift production line, and with few prospects of a follow-on program, the Air Force is likely to keep the C-17 line open as long as possible.

Next, the important C-5 legacy fleet needs to be upgraded. Barring a vast expansion of the C-17 procurement effort, there is no way to replace both the C-5A and C-5B fleets, and the C-5 has unique capabilities of its own.

To remedy the aircraft's low mission-capable rates, the Air Force is proceeding with a comprehensive C-5 upgrade effort revolving around Lockheed Martin's Reliability Enhancement and Re-engining Program (RERP). This will replace the aircraft's aging General Electric TF39 engines with GE CF6-80C2 turbofans. The program will cost up to \$6 billion, depending on how many of the service's 76 C-5As and 50 C-5Bs are upgraded. The initial contract covers the C-5B fleet alone, with considerable uncertainty about the C-5A's RERP prospects.

Several notches below these strategic lifters is Lockheed Martin's C-130J. The order book has been stagnant for several years, but the U.S. market has firmed up, providing a production line guarantee, and the Army still hopes to design its Future Combat System (FCS) with the C-130 in mind. The U.S. will also upgrade many of its older C-130Es and Hs under the C-130X and Avionics Modernization Program efforts, won by Boeing.

In short, U.S. strategic military airlift funding is a case of endless demands and growing resources. The likely juxtaposition of additional C-17 funding and the C-5 RERP marks the first time the U.S. has conducted a major upgrade for a legacy strategic lifter while procuring additional strategic lifters.

Still, it is difficult to imagine what will keep U.S. demand at its current high levels. By the end of our forecast period, in 2012-2013, the U.S. demand part of the market will trend downward, from over \$3 billion to less than half of this. But around then there might be additional products available to keep U.S. demand high.

### Growth through technology?

The most intriguing possibility for military transport market growth revolves around technology. New products with new capabilities hold potential for stimulating the market.

This pattern has been seen in the military helicopter market. The Bell/Boeing V-22 uses tilt-rotor technology to increase range and speed, but it actually lifts the same amount of equipment or troops as a helicopter that costs less than half as much. The Marine Corps, a key helicopter customer, considers the new capability and technology worth the expense. As a result, the lift part of the rotorcraft market is expected to continue growing, from about \$2 billion in 2002 to \$3 billion by 2007, and over \$5 billion by 2012.

If this pattern could be repeated, the fixed-wing lift segment could show significant growth. The next big opportunity could be the USAF's requirement for a family of stealthy transports and special mission aircraft. This family could enter service around 2015-2020 and would include a basic transport (C-X), a stealthy transport (M-X), a stealthy, penetrating tanker (K-X), and a gunship (AC-X). In terms of size, these planes would fit between the C-130J and C-17, with actual dimensions determined by the Army's FCS new family of ground vehicles.

Lockheed Martin has responded aggressively to this requirement with its MACK proposal. MACK is an acronym for

M, AC, and K-X. The company is using internal funding to generate several MACK aircraft configurations.

Boeing could also offer a product for this requirement using technology from its blended-wing body research. In early 2003 Boeing announced plans to use its old YC-15 cargo aircraft fuselage to build a demonstrator for the Air Force's Advanced Theater Transport (ATT) requirement using company money. ATT, although smaller than the C-X family proposal, essentially provides an alternative, shorter term opportunity for a new-technology airlift program.

This requirement and the Boeing and Lockheed Martin proposals emphasize stealth as the dominant new technology. But a vertical capability could also provide a strong draw. Possibly, tilt-rotor technology itself could be adapted for this role. Bell/Boeing has proposed a quad tilt-rotor design (notionally designated V-44) that would be in the C-130J class. Other options could use tilt-wing technology to provide vertical and short-field capability.

Alternatively, the U.S. could pursue lighter-than-air options, using a modern blimp to transport outsized cargo over long distances. DARPA has proposed a system dubbed Walrus. Although short-term funding looks uncertain, Walrus has the ambitious goal of a 1,000-ton cargo capacity.

Whatever technological stimulus succeeds in increasing U.S. lift funding would probably not have much of an impact on the world market, where lift requirements are less rigorous. And, like most other aerospace segments, countries make military transport purchase decisions based heavily on local industrial constituencies. Both



An HH-60G Pave Hawk helicopter is unloaded from a C-5 Galaxy at Ramstein Air Base in Germany.

of these factors help explain Airbus Military's A400M.

### Internationalization: Europe only

The military transport market underwent a major change in 2003. For decades, European countries failed to spend more than token funds on dedicated military lift. But in May 2003, Europe's OCCAR (Organization for Joint Armament Cooperation) arms agency signed the firm procurement contract launching development and production of the A400M.

The contract calls for 180 aircraft to be delivered to the launch customers. Bel-

Ground crews load a 66-ton Abrams tank onto a C-17 Globemaster III aircraft for delivery to an air base in northern Iraq.



C-130 exports have slowed to a trickle.



gium will get 7 planes; France, 50; Germany, 60; Luxembourg, 1; Spain, 27; Turkey, 10; and the U.K., 25. The intriguing aspect of these robust numbers is that none of the signatories, except for the U.K., has ever operated a transport in this class before. Most have relied on C-130s, or smaller dedicated military lifters, and tiny numbers of civilian jetliners converted for military duty.

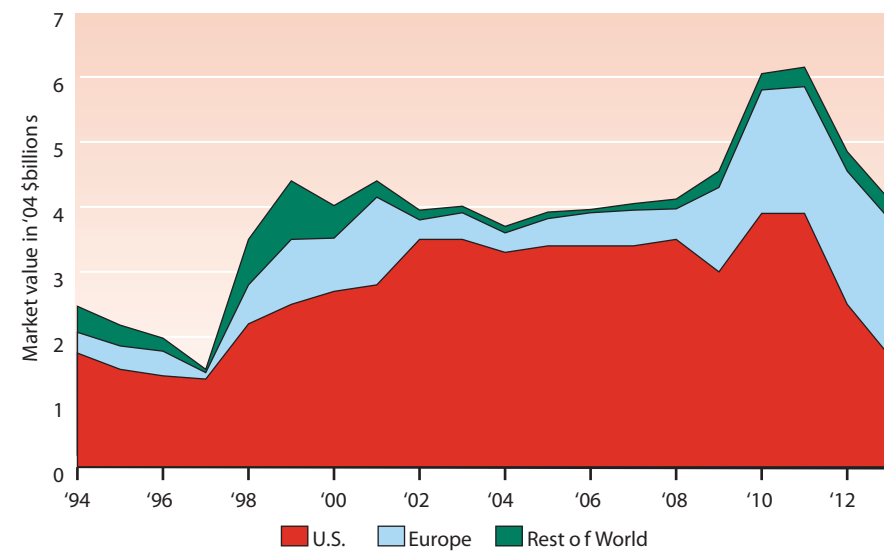
While the A400M program spent many years in limbo, the requirement for this plane was greatly increased by political change. The strategic rift between the U.S. and Europe, worsened by tensions arising from the second Iraq war, highlighted Europe's need for military self-sufficiency. If the continent's leading powers, especially France and Germany, were to create a multinational superpower independent of the U.S., they needed a rapidly deployable out-of-area force projection capability. That led to a requirement for airlift.

Purchasing U.S. aircraft off the shelf would be difficult; the high price tag would result in few taxpayer-pleasing local economic benefits. The only remaining alternative for the Europeans was to build their own plane. Because of the high development costs associated with an all-new aircraft, Europe could only afford one plane, for strategic and theater missions, something between the C-17 and the C-130J. The result is the A400M.

While the aircraft looks well suited for European requirements, there is little hope that the U.S. would decide to adapt it for the C-X/M-X/K-X role. Although in the same size class, the proposed U.S. lift family will emphasize new stealth and other new capabilities. By contrast, the A400M is a very traditional lifter.

As a result of the A400M decision,

**WORLD MILITARY TRANSPORT PROCUREMENT SPENDING**



the European demand part of the market should rise above \$2 billion annually by the end of our forecast period. Despite this tremendous market boost, the rest of the world shows little interest in military transports. For several years, Airbus Military has raised the prospect of A400M export sales to Australia, Canada, Norway, and Sweden. None of these countries appear close to signing for significant lift programs of any kind.

Meanwhile, C-130J export sales have dried up to a tiny trickle. Since 1997, only one new customer has been added—Denmark, with an order for four aircraft. The most likely explanation for this lack of international sales is that Lockheed Martin misjudged the cost-sensitive nature of the market. The C-130H was very popular with foreign users, but the J model costs over 50% more.

Brazil's C-X program illustrates the

sluggish nature of the international market. The C-X requirement called for 12 aircraft to replace 17 DHC-5 Buffaloes, with EADS/CASA's C-295 selected for purchase. This was one of the longer running military lift competitions outside the U.S. and Europe, but C-X funding remains frozen. And in July, Brazil's air force announced that it would purchase 17 used civil transports from the country's RioSul Airlines. While C-X remains on the books, there are few doubts that Brazil is following the broader global pattern of short-changing lift.

The situation elsewhere is generally worse. Some countries are at least purchasing smaller lifters, such as the C-295 or the Alenia/Lockheed Martin C-27J. But this year, South Africa announced its intention to keep operating its 11 WW II-vintage C-47s until 2012, when they will be almost 70 years old. South Africa has found the money for new Gripen fighters and Hawk trainers, but lift is almost always last on any nation's shopping list. Unsurprisingly, non-U.S., non-European demand will average only about \$200 million annually.

So, for Airbus Military, Boeing, and Lockheed Martin, market growth will come almost entirely from existing customers. But in the U.S., at least, technology could provide a way to increase spending.

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Brazil chose the C-295 to replace 17 DHC-5 Buffaloes.

